

V. REMARKS

Entry of the Amendment is proper under 37 C.F.R. §1.116 because the Amendment: a) places the application in condition for allowance for the reasons discussed herein; b) does not raise any new issue requiring further search and/or consideration because the Amendment amplifies issues previously discussed throughout prosecution; c) does not present any additional claims without canceling a corresponding number of finally rejected claims; and d) places the application in better form for appeal, should an Appeal be necessary. The Amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. The amendments to the subject claims do not incorporate any new subject matter into the claims. Thus, entry of the Amendment is respectfully requested.

Before addressing the substantive issues in the Office Action, the inventors would like to emphasize that they have devoted themselves to study and research concerning the relationship between changes in the tread radius due to inflation of tires and uneven wear. As a result thereof, they have discovered that when a circumferential main groove whose width undergoes narrowing as the tire is inflated is imparted with a particular cross-sectional shape, it is possible to effectively suppress uneven wear around or in the vicinity of the main groove. It is respectfully submitted that none of the cited references teaches to impart a particular cross-sectional shape to a main groove whose width undergoes narrowing during inflation or teaches that a tire structure comprising a combination together of a main groove whose width undergoes narrowing during inflation and a particular cross-sectional shape can bring about a remarkable advantageous result.

The Office Action objects to the specification because the Office Action alleges that the specification fails to provide proper antecedent basis for the claimed subject matter. The specification is amended as indicated above to obviate the rejection. Withdrawal of the objection is respectfully requested.

Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as unpatentable over the admitted prior art (page 1, lines 9-25, page 2, lines 1-4 and page 10, lines 14-18 in the specification) in view of Japan 9-150609. The rejection is respectfully traversed.

The admitted prior art shows a pneumatic tire having ribbed treads with circumferential grooves having widths that narrow during inflation and shows groove walls of a main groove being inclined at 80 degrees with respect to the tread. However, as admitted by the United States Patent and Trademark Office, a protrusion is not provided at the groove bottom.

Japan 609 teaches a pneumatic tire with a plurality of main grooves formed into a tread surface and extending in the radial direction of the tire.

Claim 1 is directed to a pneumatic tire provided with a plurality of main grooves extended in a tire circumferential direction on a tread surface and a main groove having a groove width narrowed during inflation among the plurality of main grooves. Claim 1 recites that both groove walls are inclined from the tread surface so as to define an acute angle between respective ones of the groove walls and the tread surface so that the groove width of the main groove becomes wider toward a groove bottom of the main groove. Further, claim 1 recites that a generally trapezoidally-shaped protrusion divides a groove space of the main groove in a tire width direction and is provided at the groove bottom with the protrusion having a pair of slanted side walls and a flat top surface disposed apart from the groove bottom and connecting the pair of slanted side walls with respective ones of the pair of slanted side walls and the both groove walls being oriented parallel to each other as viewed in cross-section. Additionally, claim 1 further recites that a height of the protrusion is made equal to or lower than the tread surface, a height difference between the protrusion and the tread surface is set in arrange from 0 to 2 mm, the height of the protrusion is at least 12 mm and a ratio of the height of the protrusion to a groove depth of the main groove is set at 0.8 or higher.

It is respectfully submitted that that none of the applied art, alone or in combination, teaches or suggests the features of claim 1. Specifically, it is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests a height of the protrusion being at least 12 mm and a ratio of the height of the protrusion to a groove depth of the main groove being 0.8 or higher. Thus, it is respectfully submitted that that one of ordinary skill in the art would not be motivated to combine the features of the applied art because such combination would not result in the claimed invention. As a result, it is respectfully submitted that claim 1 is allowable over the applied art.

Claim 6 depends from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that claim 6 is allowable at least for the reason claim 1 is allowable as well as for the features it recites.

Withdrawal of the rejection is respectfully requested.

Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as unpatentable over the admitted prior art in view of Kukimoto et al. (U.S. Patent No. 5,445,201) and at least one of Montagne (U.S. Patent No. 3,763,911) and Japan 609. The rejection is respectfully traversed.

Kukimoto shows a pneumatic tire with a tread having circumferential main grooves with groove walls outwardly inclined and a ribbed shaped protrusion located in the groove.

Montagne illustrates a tire tread with protruding elements disposed between adjacent ribs.

Japan 609 teaches a pneumatic tire with a plurality of main grooves formed into a tread surface and extending in the radial direction of the tire. In particular Japan shows a protrusion in a circumferential groove. Further, the protrusion side walls and the groove walls are oriented parallel to each other as viewed in cross section.

Claim 3 is directed to a pneumatic tire provided with a plurality of main grooves extended in a tire circumferential direction on a tread surface. Claim 3 recites that, with regard to a main groove having a groove width narrowed during inflation among the plurality of main grooves, both groove walls are inclined from the tread surface so as to define an acute angle between respective ones of the groove walls and the tread surface so that the groove width of the main groove becomes wider toward a groove bottom of the main groove, and a protrusion dividing a groove space of the main groove in a tire width direction is provided at the groove bottom with the protrusion having a pair of side walls and respective ones of the pair of side walls and the both groove walls being oriented parallel to each other as viewed in cross-section. Further, claim 3 recites that the protrusion is made equal to or lower than the tread surface, a height difference between the protrusion and the tread surface is set in a range from 0 to 2 mm, the height of the protrusion is at least 12 mm and a ratio of the height of the protrusion to a groove depth of the main groove is set at 0.8 or higher.

It is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests the features of claims 1 and 3. Specifically, it is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests a height of the protrusion being at least 12 mm and a ratio of the height of the protrusion to a groove depth of the main groove being at 0.8 or higher as recited in claims 1 and 3. Thus, it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine the features of the applied art because such combination would not result in the claimed invention. As a result, it is respectfully submitted that claims 1 and 3 are allowable over the applied art.

Claim 6 depends from claim 1 and claim 3 includes all of the features of these claims. Thus, it is respectfully submitted that claim 6 is allowable at least for the reason claim 1 and 3 are allowable as well as for the features it recites.

The claim 2 is canceled and therefore the rejection as applied to claim 2 is now moot.

Withdrawal of the rejection is respectfully requested.

Claim 4 is rejected under 35 U.S.C. 103(a) as unpatentable over the admitted prior art in view of Kukimoto et al. and at least one of Montagne and Japan 609 and further in view of Japan 9-11709 (Japan 709). The rejection is respectfully traversed.

Japan 709 teaches a pneumatic radial tire that is particularly useful for carrying heavy loads.

Claim 4 depends from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that claim 4 is allowable at least for the reason claim 1 is allowable as well as for the features it recites. In particular, claim 4 recites that the protrusion is divided in the tire width direction by a slit formed into the flat top surface towards the groove bottom and extending circumferentially thereabout to form a first divided protrusion section and a second divided protrusion section in facial contact with the first divided protrusion section at the slit.

Withdrawal of the rejection is respectfully requested.

Claim 5 is rejected under 35 U.S.C. 103(a) as unpatentable over the admitted prior art in view of Kukimoto et al. and at least one of Montagne and Japan 609 and further in view of Overman (U.S. Patent No. 2,254,622). The rejection is respectfully traversed.

Overman teaches a method for forming tires with the ribs of different compositions.

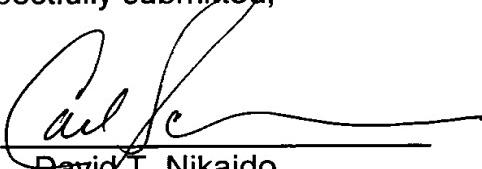
Claim 5 depends from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that claim 5 is allowable at least for the reason claim 1 is allowable as well as for the features it recites.

Withdrawal of the rejection is respectfully requested.

In view of the foregoing, reconsideration of the application and allowance of the pending claims are respectfully requested. Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' representative at the telephone number listed below.

Should additional fees be necessary in connection with the filing of this paper or if a Petition for Extension of Time is required for timely acceptance of the same, the Commissioner is hereby authorized to charge Deposit Account No. 18-0013 for any such fees and Applicant(s) hereby petition for such extension of time.

Respectfully submitted,

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Date: December 23, 2003

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Enclosure(s): Petition for Extension of Time (one month)

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